

Character association analysis in sesame (*Sesamum indicum* L.)

Subashini, G. *, K.Baghyalakshmi, Suvarna Rani CH, and R.Vinoth

Department of Rice, Centre Plant Breeding and Genetics, Tamil Nadu Agricultural University, Coimbatore -641003, Tamil Nadu, India. *Corresponding author's E-mail: subapbg2009@gmail.com

Received: July 19, 2015

Accepted: August 21, 2015

Published: September 27, 2015

ABSTRACT

A line x tester analysis was carried out with seven lines and five testers of sesame genotypes in respect of ten quantitative traits for association study to assess the relationship among yield and its components for selection criteria. Observations were recorded on ten traits viz days to 50% flowering, plant height, number of branches per plant, number of capsules on main stem, number of capsules on branches, number of capsules per plant, number of seeds per capsule, 1000 seed weight, oil content and single plant yield. Character association analysis revealed an intensive selection in the positive side for number of capsules on main stem, number of capsules on branches will improve the seed yield since these traits expressed significantly positive correlation with seed yield and among themselves.

Key words: Sesamum, lines, testers, character association

Sesame (*Sesamum indicum* L.) is one of the ancient and traditional oilseed crops cultivated in India, for its quality oil. The seed contains 50-60% oil which has excellent stability due to the presence of natural antioxidants such as sesamol, sesamin and sesamol. The fatty acid composition of sesame oil varies considerably among the different cultivars worldwide. After oil extraction, the remaining meal contains 35-50% protein, and is rich in tryptophan and methionine. Seeds with hulls are rich in calcium (1.3%) and provide a valuable source of minerals (Johnson et al. 1979). The addition of sesame to the high lysine meal of soybean produces a well-balanced animal feed. India ranks first in the world in sesame cultivation (27.7% area) but its productivity is quite low (368kg/ha) as compared to world's average (489 kg/ha) (FAO, 2004). Selection merely based on yield is not effective. A study of nature and degree of association of component characters with yield assumes greater importance for fixing up characters that play a decisive role in influencing yield. Information on the association of plant characters with seed yield is of great importance to breeder in selecting desirable genotypes. Hence, the content and single plant yield. The line x tester analysis was done as per the method suggested by Kempthorne(1957).

present investigation was carried out to gather information on character association analysis in 35 crosses and its parents of sesame for ten quantitative characters.

MATERIALS AND METHODS

The experimental material for the present investigation comprised of 35 hybrids obtained by line x tester mating design by crossing 7 lines viz., NIC 7907, NIC 7908, NIC 7933, NIC 7936, NIC 7937, NIC 8009 and NIC 8010 and 5 testers viz., CO1, TMV3, TMV4, SVPR1 and VRI1. These 35 hybrids along with 12 parents were raised during rabi season of 2002-2003 at Department of Plant Breeding and Genetics, Madurai with a spacing of 30 x 30 cm. The experiment was laid out in a randomized block design with three replications. Recommended package of practices with need based plant protection measures were followed. Observations were recorded on Days to 50 per cent flowering, Plant height, number of branches per plant, number of capsules on main stem, number of capsules on main branches, number of capsules per plant, number of seeds per capsule, 1000 seed weight, oil

RESULTS AND DISCUSSION

Seed yield vs other characters:

Seed yield is a complex metric character, which is the end result of interrelated traits. Knowledge of the association of component traits with yield may greatly help in for a precise and accurate selection. Seed yield per plant was positively and significantly correlated with, plant height (0.425 and 0.433), number of branches per plant (0.210 and 0.222), number of capsules on main stem (0.500 and 0.509) number of capsules on branches (0.732 and 0.747), number of capsules per plant (0.728 and 0.736), number of seeds per capsule (0.386 and 0.394), 1000 seed weight (0.833 and 0.870) Similar results were observed by Manivannan (1998). However the character oil content showed non-significant association with seed yield per plant and days to 50 per cent flowering showed a non-significant and negative correlation with yield (Table 1).

Interrelation among yield components

Table 1. Character association analysis for yield and yield components

Character	Days to 50 per cent flowering	Plant height	Number of branches per plant	Number of capsules on main stem	Number of capsules on branches	Number of capsules per plant	Number of seeds per capsule	1000 seed weight	Oil per cent	Single plant yield
Days to 50 per cent flowering	1.00	-0.294	-0.032	-0.626	-0.629	-0.693	-0.130	-0.504	0.119	-0.598
Plant height		1.000	0.294*	0.361*	0.583*	0.561*	0.560*	0.155	0.474*	0.433*
Number of branches per plant			1.000	0.478*	0.210*	0.320*	0.570*	-0.227	0.263*	0.222*
Number of capsules on main stem				1.000	0.599*	0.810*	0.375*	0.208*	0.132	0.509*
Number of capsules on branches					1.000	0.955*	0.375*	0.545*	0.150	0.747*
Number of capsules per plant						1.000	0.414*	0.476*	0.159	0.736*
Number of seed per capsule							1.000	-0.068	0.339*	0.394*
1000 seed weight								1.000	-0.103	0.870*
Oil per cent									1.000	0.037
Single plant yield										1.000

The present study clearly indicated that more number of capsules on branches with more seed weight and number of seeds per capsule are outstanding

The information on the inter correlation between the yield contributing traits showed the nature and extent of their relationship with each other. This will be a help for the simultaneous improvement of different characters along with the seed yield in breeding programmes.

Plant height had significantly positive correlations with all other yield attributes except 1000 seed weight. Number of branches per plant had significant and positive association with, number of branches per plant, number of capsules on main stem, number of capsules on main branches, number of capsules per plant, number of seeds per capsule. The trait number of capsules per plant had positive and significant association with number of seeds per capsule and 1000 seed weight. Tomar et al. (1999), Pawar et al. (2002), Kumaresan and Nadarajan (2002) and Deepa Sankar and Ananda Kumar (2003) also reported various components association with seed yield.

contributions made by the parents for yield per plant in their F₁s. These traits were interrelated with each other. Therefore, a selection for any of the three characters

would cause a simultaneous improvement in all these characters, which would ultimately improve the yield.

REFERENCES

Deepa Sankar, P. and C.R. Ananda Kumar. 2003. Genetic analysis of yield and related components in sesame (*Sesamum indicum* L.). *Crop Res.*, 25(1) : 91-95.

Food and Agricultural Organization, Database: 2004, (www.fao.org).

Kemphrone, O. 1957. An introduction of genetic statistics. John Wiley and Son. Inc., New York.

Kumaresan, D. and N. Nadarajan. 2002. Association of yield with some biometrical

and characters over different environments in sesame (*Sesamum indicum* L.). *Sesame and Safflower Newsl.*, 17 :13-16.

Manivannan N (1998). *Madras Agricultural Journal*, 85 (5,6), 295-296

Pawar, K.N., M.B. Chetti and Shamrao Jahagirdar. 2002. Association between seed yield and yield attributing characters in sesame (*Sesamum indicum* L.) *Agri. Sci. Digest*, 22(1): 18 -20

Tomar, H. S., G. K. Srivastava, O. P. Tiwari and R. S. Tripathi 1999. Correlation and path coefficient analysis of various components on seed yield of summer sesame. *J. Oilseeds Res.*, 16: 137-138